

REMARKS

The rejections presented in the Office Action dated October 6, 2005 have been considered. Claims 1-4 and 6-20 are pending in the application. Reconsideration and allowance of the application are respectfully requested.

The Office Action fails to establish that claims 1-4, 6-12, 14 and 17-20 are unpatentable under 35 U.S.C. 103(a) over "White" ("Reconfigurable, Retargetable Bignums" by White) in view of "Hardy" (U.S. Patent No. 5,640,496 to Hardy et al.) and further in view of "Carey" (US patent 6,078,994 to Carey). The rejection is respectfully traversed because the Office Action fails to show that all the limitations are suggested by the references and fails to provide a proper motivation for modifying the teachings of White with teachings of Hardy, and further modifying the teachings of White with teachings of Carey.

The cited teachings of Carey neither teach nor suggest the claim limitations. The Office Action explains that "the teaching in Carey that is relied upon is simply the application of an optimal range of available nodes in a free list (minimum and maximum thresholds)." Looking then to how Carey accomplishes this, it can be seen that the approach taught by Carey does not reasonably correspond to or even suggest the claim limitations.

The claim limitations set forth allocating memory for a first number of available storage nodes, responsive to the total number being less than first threshold value, and establishing the first number of available storage nodes; and removing from the plurality of available storage nodes, responsive to the total number being greater than a second threshold value, a second number of storage nodes and deallocating memory for the second number of storage nodes. Carey, in order to achieve the desired number of available free pages, does not allocate and deallocate memory as claimed. Rather, Carey teaches returning pages that are used to a list of free page buffers.

Carey teaches a system in which data retrieved from mass storage is stored in a page buffer taken from a free buffer list for access by users-sessions (col. 5, l. 1-4; 54-56). "To minimize processing delays which can occur when the free list becomes empty, the paging manager 15 maintains a counter of the number of entries on the free

list.” (col. 7, l. 40-42). When a minimum threshold is met, a collecting operation frees additional page buffers (col. 7, l. 43-46). The page buffers that are put back to the free list are taken from the page buffers that are in use (col. 7, l. 64 – col. 8, l. 43). Thus, Carey reclaims page buffers that are in use, and Carey’s approach would render the White-Hardy combination inoperable. If, in applying Carey’s approach to the White-Hardy combination, memory used to store a bignum in the White-Hardy combination was collected while a program was using that bignum, the program’s operation would be corrupted.

Furthermore, as explained in the previous amendment, Carey does not teach the specific claim limitations of allocating and deallocating memory. Carey teaches managing a list of free page buffers. Carey’s allocation of memory for caching persistent data takes place at startup (col. 7, l. 60-63), which shows that Carey distinguishes between management of a free list and the claim limitations of allocating and deallocating memory.

Thus, Carey’s manner of maintaining a desirable number of free page buffers neither teaches nor suggests the claim limitations.

The Office Action further fails to show that the White-Hardy combination suggests the limitations of storing a numerical value in the allocated plurality of storage nodes and forming a linked list of the allocated plurality of storage nodes.

The Office Action acknowledges that White “does not detail methods for memory management,” and goes on to allege that “one of ordinary skill in the art would have to look to the prior art (i.e. Hardy) to provide such an implementation.” However, there is no evidence presented that supports the assertion that one would “have” to look to Hardy’s prior art teachings to implement memory management for White’s bignums. Given the absence of evidence, there is simply no indication that White would “have” to rely on Hardy’s teachings as opposed to an alternative approach, for example, heap memory management. Therefore, the White-Hardy combination does not suggest all the claim limitations.

The alleged motivation for combining Hardy with White does not support a *prima facie* case of obviousness. The alleged motivation states that “it would have been obvious ... to use Hardy’s methods of memory allocation/deallocation (col. 8, lines 4-27)

with White's invention (pg. 176, col. 2, par. 3) to provide memory space for White's Bignums (pg. 177, par. 1 'Bignums are allocated in units of at least one 32-bit word') because one of ordinary skill in the art would have been motivated to provide an efficient memory management system (Hardy col. 8, line 4 'memory must be managed efficiently') to support White's disclosure of memory allocation (pg. 176, col. 2, par. 3)." This alleged motivation is improper because it is unsupported by evidence.

It is well-established that clear and particular evidence of making the combination must be provided in order to establish a *prima facie* case of obviousness. Addressing the "rigorous ... requirement for a showing of the teaching or motivation to combine prior art references," the Court of Appeals for the Federal Circuit stated in *In re Dembiczak*, 175 F.3d 994, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999):

We have noted that evidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, (citations omitted), although "the suggestion more often comes from the teachings of the pertinent references," *Rouffet*, 149 F.3d at 1355, 47 USPQ2d at 1456. The range of sources available, however, does not diminish the requirement for actual evidence. That is, the showing must be clear and particular. See, e.g., *C.R. Bard*, 157 F.3d at 1352, 48 USPQ2d at 1232. Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence." (citation omitted)

The alleged motivation draws the conclusion, without supporting evidence, that White's memory management is less efficient than that taught by Hardy. Therefore, the alleged motivation to combine Hardy with White is insufficient to support *prima facie* obviousness.

Claims 2-4 and 6-9 depend from claim 1 and are not shown to be unpatentable over the White-Hardy combination for at least the reasons set forth above.

The limitations of claim 10 are not shown to be suggested by White. The Office Action cites White's "seamless interface between fixnums and bignums" as suggesting the limitations of overloading language-provided memory allocation and deallocation operators with large-integer operators that allocate and deallocate storage nodes. However, even if one assumes that White's numerical operators are overloaded, it does not necessarily follow that memory allocation operators would also have to be

overloaded to support allocation and deallocation of storage nodes as claimed. Furthermore, no evidence is presented that indicates overloading memory operators necessarily follows from overloading numerical operators. Thus, the Office Action fails to show that the limitations of claim 10 are suggested by White.

Claim 11 depends from claim 1 and is not shown to be unpatentable for at least the reasons set forth above. Furthermore, claim 11 calls out two steps of recursively performing a large-integer divide operation on different portions of the dividend. It is respectfully submitted that Knuth does not show recursion as understood by those skilled in the art. Knuth's algorithm D shows a program loop implementation, and program D on page 259 is assembly language in which there is no apparent recursion. Furthermore, two recursion steps are claimed for different parts of the dividend, whereas Knuth shows a single loop. An explanation of that part of Knuth's algorithm understood to teach recursion is respectfully requested if the rejection is maintained.

Claim 12 depends from claim 11 and is not shown to be unpatentable for at least the reasons set forth above.

Claims 14 and 17 depend from claim 1, and claim 20 depends from apparatus claim 18. Thus, these claims are not shown to be unpatentable for at least the reasons set forth above.

The rejection of claims 1-4, 6-12, 14 and 17-20 should be withdrawn because a *prima facie* case of obviousness has not been established.

The Office Action fails to establish that claim 13 is unpatentable under 35 U.S.C. 103(a) over the White-Hardy combination further in view of "Burnikel" ("Fast Recursive Division" by Burnikel et al.). The rejection is respectfully traversed because the Office Action fails to show that all the limitations are suggested by the references and fails to provide a proper motivation for modifying the teachings of the White-Hardy combination with teachings of Burnikel. Claim 13 depends from claim 12, and the limitations are not shown to be suggested and the alleged motivation for making the combination is improper for at least the reasons set forth above.

The Office Action fails to establish that claim 15 is unpatentable under 35 U.S.C.


103(a) over the White-Hardy combination further in view of "Esakov" ("Data Structures, an Advanced Approach Using C" by Esakov et al.). The rejection is respectfully traversed because the Office Action fails to show that all the limitations are suggested by the references and fails to provide a proper motivation for modifying the teachings of the White-Hardy combination with teachings of Esakov. Claim 15 depends from claim 1, and the limitations are not shown to be suggested and the alleged motivation for making the combination is improper for at least the reasons set forth above.

The Office Action fails to establish that claims 16 and 19 are unpatentable under 35 U.S.C. 103(a) over the White-Hardy combination further in view of "Anderson" (U.S. Patent No. 5,619,711 to Anderson). The rejection is respectfully traversed because the Office Action fails to show that all the limitations are suggested by the references and fails to provide a proper motivation for modifying the teachings of the White-Hardy combination with teachings of Anderson. Claim 16 depends from claim 1, and claim 19 depends from claim 18. Thus, the Office Action does not establish that claims 16 and 19 are unpatentable for at least the reasons set forth above for claim 1 over the White-Hardy combination.

Withdrawal of the rejections and reconsideration of the claims are respectfully requested in view of the remarks set forth above. No extension of time is believed to be necessary for consideration of this response. However, if an extension of time is required, please consider this a petition for a sufficient number of months for consideration of this response. If there are any additional fees in connection with this response, please charge Deposit Account No. 50-0996 (USYS.030PA).

Respectfully submitted,

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